

REMARKS

The above amendments are believed to place the claims in proper condition for examination. Early and favorable action is awaited.

Claims 7 - 11 and 16 - 20 remain in this application. Claims 16 - 20 have been added; and claims 1 - 6 and 12 - 15 have been canceled without prejudice or disclaimer.

The applicants thank the Examiner for withdrawing his previous objections to the specification, and claims 3 and 5, as well as his previous indefiniteness rejection under 35 U.S.C. §112, second paragraph, as set forth on page 2 of the outstanding Office Action.

However, as to the merits of this case, the Examiner has relied on a new reference (namely, Webb, U.S. Patent No. 5,516,705)^{1/} in setting forth the following obviousness rejections in the Office Action dated May 22, 2003:

- (1) claims 1, 2 and 7 - 9 are rejected under 35 U.S.C. §103(a) as being unpatentable over Webb (U.S. Patent No. 5,516,705);
- (2) claims 3, 6, 10 and 12 - 14 are rejected under 35 U.S.C. §103(a) based on Webb in view of Takizawa (U.S. Patent No. 5,962,878) and Assour (U.S. Patent No. 4,292,646);

^{1/}It is respectfully noted that this newly relied Webb patent is different from the Webb patent (U.S. Patent No. 5,479,031), which the Examiner withdrew in his Office Action dated December 4, 2002.

(3) claims 4, 11 and 15 are rejected under 35 U.S.C. §103(a) based on Webb, Takizawa and Assour, and further in view of Planey (U.S. Patent No. 3,772,577); and

(4) claim 5 is rejected under 35 U.S.C. 103(a) based on Webb, Takizawa and Assour, and further in view of Casey et al. (U.S. Patent No. 6,448,589).

The applicants respectfully request reconsideration of these rejections.

As indicated above, claims 7 - 6 and 12 - 15 have been canceled without prejudice or disclaimer. Thus, the outstanding rejections of these claims are now moot.

As to remaining claims and the added claims, the applicants respectfully submit that in the applicants' claimed invention, as set forth in claim 16, include the structural arrangements of "ring-shaped first moat positioned at the edge portion of regions constituted by the first emitter layer and first ohmic layer, wherein the first moat have a bottom surface deeper than the first base layer and the bottom surface reach the first buried layer" and "ring-shaped second moat positioned at the edge portion of regions constituted by the second emitter layer and second ohmic layer, wherein the second moat have a bottom surface deeper than the second base layer and the bottom surface reach the first buried layer."

Furthermore, in the applicants' instant claimed invention, cylindrical junction and spherical junction of PN junction formed between the first base layer and the first emitter layer,

and between the second base layer and the second emitter layer are removed by the first moat and second moat.

As to Webb, the semiconductor device described in Webb has the first moat. However, the bottom of the moat does not reach the first and second buried layers. Therefore, the edge of the outer periphery of base regions 134, 138 described in Webb is terminated at the edge of the semiconductor device; i.e., the cutoff face of the semiconductor device.

Furthermore, the first moat of Webb is far from the emitter layer 132 and 136. As such, the applicants' claimed invention is distinguishable over the teachings of Webb.

With respect to Takizawa, reference numeral 16 of Takizawa does not designate a moat, but an emitter-push restraining layer made of P⁺ diffusion layer (see, column 11, line 60 through column 12, line 3 of Takizawa).

Therefore, if the bottom of the emitter-push restraining layer 16 reached the first and second buried layers, the applicants' claimed invention is distinguishable over Takizawa's device.

With respect to Assour, the semiconductor device disclosed in Assour has a ring-shaped moat. However, such semiconductor device does not have the first and second buried layers having a first conductivity type higher than the semiconductor substrate and located within the semiconductor substrate.

With respect to Assour's semiconductor device, assuming, *arguendo*, that body 48 of N⁻ type is the buried layer of the applicants' instant claimed invention, the bottom of the moat described in Assour is positioned in the base region 82, and does not reach the body 48.

As described above, Webb, Takizawa or Assour does not disclose the following claimed structural arrangements: "ring-shaped first moat positioned at the edge portion of regions constituted by the first emitter layer and first ohmic layer, wherein the first moat have a bottom surface deeper than the first base layer and the bottom surface reach the first buried layer" and "ring-shaped second moat positioned at the edge portion of regions constituted by the second emitter layer and second ohmic layer, wherein the second moat have a bottom surface deeper than the second base layer and the bottom surface reach the first buried layer."

Added claims 17 - 20 depend on added claim 16, and further limit the scope of claim 16. Thus, at least for the reasons discussed above with respect to claim 16, added claims 17 - 20 should now be similarly allowable.

Patent Appln. Serial No. 10/014,407

In view of the above, the withdrawal of the outstanding obviousness rejections under 35 U.S.C. §103(a) set forth in the Office Action dated May 22, 2003 in the parent application is in order, and is therefore respectfully solicited.

The above amendments are believed to place the claims in proper condition for examination. Early and favorable action is awaited.

In the event that any fees are due in connection with this paper, please charge our Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, WESTERMAN & HATTORI, LLP



Mel R. Quintos
Attorney for Applicants
Reg. No. 31,898

MRQ/lrj/_ipc

Atty. Docket No. 011622
Suite 1000
1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930



23850
PATENT TRADEMARK OFFICE